

UNITED STATES PATENT OFFICE.

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METHOD OF RECORDING AND REPRODUCING SOUNDS OR SIGNALS.

SPECIFICATION forming part of Letters Patent No. 661,619, dated November 13, 1900.

Application filed July 8, 1899. Serial No. 723,198. (No specimens.)

To all whom it may concern:

Be it known that I, VALDEMAR POULSEN, a subject of the King of Denmark, residing at Copenhagen, in the Kingdom of Denmark, have
 5 invented certain new and useful Improvements in Methods of and Apparatus for Effecting the Storing up of Speech or Signals by Magnetically Influencing Magnetizable Bodies, (for which I have applied for patents
 10 in England, No. 8,961, dated April 28, 1899; in Germany, dated December 9, 1898; in Austria, dated April 22, 1899; in Hungary, No. 6,494, dated May 1, 1899; in France, No. 276,184, dated April 26, 1899; in Belgium, No. 111,719,
 15 dated April 26, 1899; in Italy, dated May 2, 1899; in Spain, dated April 26, 1899; in Portugal, dated May 8, 1899; in Switzerland, No. 21,005, dated April 25, 1899; in Russia, dated April 26, 1899; in Norway, No. 11,076, dated
 20 April 26, 1899; in Sweden, dated March 20, 1899, and in Denmark, No. 1,260, dated December 1, 1898,) of which the following is a specification.

It has long been possible to transmit messages, signals, &c., by electrical means.

The present invention represents a very essential advance in this branch of science, as it provides for receiving and temporarily storing messages and the like by magnetically
 30 exciting paramagnetic bodies. The solution of this problem is based on the discovery that a paramagnetic body, such as a steel wire or ribbon, which is moved past an electromagnet connected with an electric or magnetic transmitter, such as a telephone, is magnetically excited along its length in exact
 35 correspondence with the signals, messages, or speech delivered to the transmitter, and, further, that when the magnetically-excited wire is again moved past the electromagnet it will reproduce the said signals, messages, or speech
 40 in a telephone-receiver connected with the said electromagnet.

The invention is of great importance for
 45 telephonic purposes, as by providing a suitable apparatus in combination with a telephone communications can be received by the apparatus when the subscriber is absent, whereas upon his return he can cause the
 50 communications to be repeated by the apparatus.

Further, the present invention will replace

the phonographs hitherto used and provide simpler and better-acting apparatus.

As is well known, in the usual phonographs 55 the vibrations of air transmitted to a membrane are caused by means of suitable mechanical parts to make indentations in a receptive body, which indentations can cause a membrane to repeat the said vibrations by 60 suitable mechanical means. Mechanical alterations of such bodies, however, give rise to disturbing noises, which apart from the expense of such apparatus is one of the principal reasons why the phonograph has not 65 come more extensively into use.

In the accompanying drawings one form of this invention is illustrated.

Figure 1 is a front elevation and partial section of the phonographic apparatus. Fig. 70 2 is a section on line *xx* of Fig. 1 looking up. Fig. 3 is a section on line *yy* of Fig. 1 looking down. Fig. 3* is a detail view of the electromagnet and its carrier. Fig. 4 is a section on line 4 4 of Fig. 5. Fig. 5 is a section on 75 line 5 5 of Fig. 4. Fig. 6 is a diagrammatic representation of electrical connections designed for the purpose of explaining the mode of operation of the invention.

In the apparatus illustrated the paramagnetic body used consists of a steel wire which is spirally wound on a drum.

The construction of the apparatus is as follows:

a indicates a casing for a clockwork, one 85 of the wheels of which is indicated by *a'*. Upon this casing is supported a stirrup-shaped frame *b*, the two arms of which are arranged on opposite sides of a central spindle *c*. On this spindle is mounted a cylinder *d*, which 90 is held stationary by being fastened to the spindle in any suitable way, and the spindle itself is fixed to the casing.

e is a bow-shaped frame consisting of a piece of tubing bent into shape and having its ends 95 connected by an arm *e'*, mounted to turn on the spindle *c*. The upper end of the bow has a bearing at the middle of the frame *b* by means of a short stud 44, which passes through the bow and enters the frame *b*. Rotary motion is imparted to the bow *e* by means of the 100 clockwork in the casing *a*, which is provided with a wheel 13, engaging with a pinion 12 on the hub of the arm *e'*. A fixed ring 48, car-